Voids in Concrete Placements on Interior Walls

of the Auxiliary Building

Initial Report: On December 20, 1979 Mr. K. M. Gillespie, Project Construction Manager for Georgia Power Company at Plant Vogtle, informed Mr. Floyd Cantrell of NRC Region II that a potential significant deficiency existed at Plant Vogtle concerning voids in concrete around penetrations.

Interim Report: On January 18, 1980 Georgia Power Company filed an interim report with the NRC Region II office.

Background:

Recently, in removing the forms around concrete wall pours in the auxiliary building (examples A-08D-050 and A-08D-019), Georgia Power Company observed voids in concrete placements on interior walls. These voids occurred during concrete placements within the auxiliary building where accessibility to inspect for proper concrete consolidation is limited. A concrete post-placement inspection report was prepared. After review, additional non-conformance reports as well as a stop work order (SW-C-13, 12/20/79) were issued by the Georgia Power Civil-Structural Quality Control Department.

Evaluation:

The voids in concrete around penetrations could potentially cause a weakening of the structural strength or integrity of the auxiliary building if not repaired. The extreme measure of postulating failure of walls could also result in postulating failure of equipment above these walls. Additionally, these walls function as radiation shields. Potentially, plant personnel could be exposed to larger than expected amounts of radiation if the voids were not repaired.

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Corrective Action:

(1) To avoid recurrence of the problem, Georgia Power Company will install one (1) foot high panel alternating on four (4) foot centers the entire length of each wall at the base slab, leaving out every other panel on both sides of each wall. Panels will be completed after final cleanout inspection.

To allow better concrete consolidation, tremie placement is pre-planned to allow better concrete flow in congested areas. Port holes will be provided for inspection/placement at blockouts and congested areas. Additional horizontal construction joints will be provided as necessary to insure sufficient access for pre-placement inspection, placement, consolidation, and inspection of consolidation. Additionally, one-inch diameter vibrators will be provided for use in congested areas.

Necessary retraining with emphasis on the importance of proper consolidation of concrete has been given to craft and Georgia Power Company field operations and quality control personnel.

(2) To correct the void problem existing procedure CD-T-02, Rev. 7, paragraph C was used. The paragraph in the procedure reads as follows:

> "Voids are those areas where honeycomb pockets are so deep that reinforcing steel is exposed. Areas where reinforcing steel is completely exposed shall be prepared for patching by chipping and scarifying the concrete in a hinged section to not less than 2 ± 1/2 inches behind the reinforcing and the resulting space filled with concrete matching that of the basic structure except that the maximum size of the aggregate shall be 3/4 inch. Prior to placing the concrete, an application of an epoxy bonding compound shall be applied to all exposed surfaces. A Nonconformance Report shall be filed for the patching of voids. All patch areas shall be wet cured for a minimum of three (3) days starting immediately after completion of the patching operation."

(3) Corrective action has been completed for this particular problem and will be carried forth in the future.

Summary:

Georgia Power Company has evaluated the problem and determined it is a deficiency which could have affected adversely the safety of operations of the plant at some time in the expected lifetime of the plant were it to have remained uncorrected.

A deficiency existed in the construction of a structure which required extensive repair to meet the approved criteria and bases.

In addition, Georgia Power Company has conducted a substantial safety hazard evaluation and concluded this problem would have constituted a safety hazard due to postulated failures, assuming the voids, if not repaired, could result in equipment failure and increased radiation exposure.